IN THE CLAIMS:

The following is a complete listing of the claims in this application, reflects all changes currently being made to the claims, and replaces all earlier versions and all earlier listings of the claims:

1.-4. (Cancelled)

5. (Currently Amended) A method of segmenting an image formed by a plurality of pixels, each pixel being described by a vector having components each relating to a different measured image characteristic, said method comprising the steps of:

(a) receiving, for each pixel, a plurality of the vector components and a corresponding error covariance representation of that pixel;

(b) for each pixel, fitting each component and the corresponding covariance representation to a predetermined linear model to obtain a set of model parameters and corresponding confidence representations;

~~A method according to claim 4 wherein step (c) comprises the sub-steps of:~~

(c~~a~~) defining ~~said~~ the pixels [[to]] each to be initial regions of ~~said~~ the image;

(c~~bd~~) merging ~~said~~ the regions in a statistical order using ~~said~~ the sets of model parameters and confidence representations to obtain a null segmentation of ~~said~~ the image;

(~~cce~~) analysing a curve formed using ~~said~~ the model parameters and corresponding confidence representations to determine an optimal halting criterion at which to cease the merging of ~~said~~ the regions; and

(~~cdf~~) processing said merging of ~~said~~ the initial regions to halt when ~~said~~ the optimal merging criterion is reached.

6. (Currently Amended) A method according to claim 5, wherein sub-step (~~cdf~~) comprises re-executing the ~~entire merge~~ merging of ~~said~~ the initial regions using said model parameters and confidence representations ~~to provide said merged segmentation~~, and halting when the optimal merging criterion is reached.

7. (Currently Amended) A method according to claim 5, wherein sub-step (~~cce~~) comprises identifying returns to monotonicity from local minima in ~~said~~ the curve and selecting a predetermined ~~said~~ the return approaching the null segmentation as ~~said~~ the optimal halting criterion.

8. (Currently Amended) A method according to claim 7, wherein step (~~cdf~~) comprises re-executing the ~~merge~~ merging of ~~said~~ the initial regions using ~~said~~ the model parameters up until ~~said~~ the predetermined return is reached ~~to provide said merged segmentation~~.

9. (Currently Amended) A method according to claim 5, wherein ~~said~~ the statistical order is determined using an order of minimum covariance-normalised vector distance between adjacent regions of ~~said~~ the segmentation.

10. (Currently Amended) A method according to claim 5, wherein ~~said~~ the statistical order is determined using a length of a common boundary between adjacent regions.

11. (Currently Amended) A method according to claim 5, wherein ~~said~~ the statistical order is determined by dividing a minimum covariance-normalised vector distance between adjacent regions of ~~said~~ the segmentation by a length of a common boundary between adjacent regions, and ordering the resulting quotients.

12. (Currently Amended) A method according to claim 11, wherein each ~~said~~ quotient forms a test statistic, a record of which is retained at each merging step to form the curve.

13. (Currently Amended) A method according to claim [[4]] 5, wherein ~~said~~ the plurality of vector components comprise at least two of colour, range and motion.

14. (Currently Amended) A method according to claim [[5]] 13, wherein ~~said~~ the colour vector component comprises at least one colour channel of a colour space in which ~~said~~ the image can be reproduced.

15. (Currently Amended) A method for unsupervised selection of a stopping point for a region-merging segmentation process, said method comprising the steps of:

(a) analysing a graph of merging cost values to identify departures from substantial monotonicity of ~~said~~ the graph; and

(b) selecting ~~said~~ the stopping point to be a merging cost value corresponding to a return to monotonicity of ~~said~~ the graph, ~~said~~ the selected stopping point being associated with one of a limited plurality of final ~~said~~ ones of the departures in ~~said~~ the region merging process.

16. (Currently Amended) A method according to claim 15, wherein ~~said~~ the selected stopping point comprises a return from ~~said~~ the final departure.

17. (Currently Amended) A method according to claim 15, wherein ~~said~~ the departures are larger than a predetermined threshold.

18. (Currently Amended) A method according to claim 15, wherein ~~said~~ the merging cost function comprises an ordered series of test statistics, each ~~said~~ test statistic being formed, for each adjacent pair of regions in the segmented image, by dividing a covariance-normalised vector distance between the pair by a length of a common boundary between the pair.

19.-22. (Cancelled)

23. (Currently Amended) Apparatus for segmenting an image formed by a plurality of pixels, each pixel being described by a vector having components each relating to a different measured image characteristic, said apparatus comprising:

means for receiving, for each pixel, a plurality of the vector components and a corresponding error covariance representation of that pixel;

means for fitting, for each pixel, each component and the corresponding covariance representation to a predetermined linear model to obtain a set of model parameters and corresponding confidence representations;

~~Apparatus according to claim 22 wherein said analysing means comprises:~~

defining means for defining ~~said~~ the pixels [[to]] each to be initial regions of ~~said~~ the image;

merging means for merging ~~said~~ the regions in a statistical order using ~~said~~ the sets of model parameters and confidence representations to obtain a null segmentation of ~~said~~ the image;

curve analysing means for analysing a curve formed using ~~said~~ the model parameters and corresponding confidence representations to determine an optimal halting criterion at which to cease the merging of ~~said~~ the regions; and

processing means for processing ~~said~~ the merging of ~~said~~ the initial regions to halt when ~~said~~ the optimal merging criterion is reached.

24. (Currently Amended) Apparatus according to claim 23, wherein said processing means comprises means for re-executing the ~~entire merge~~ merging of ~~said~~ the

initial regions using ~~said~~ the model parameters and confidence representations ~~to provide said merged segmentation~~, and halting when the optimal merging criterion is reached.

25. (Currently Amended) Apparatus according to claim 23, wherein said curve analysing means comprises means for identifying returns to monotonicity from local minima in ~~said~~ the curve and means for selecting a predetermined ~~said~~ the return approaching the null segmentation as ~~said~~ the optimal halting criterion.

26. (Currently Amended) Apparatus according to claim 25, wherein said processing means comprises means for re-executing the ~~merge~~ merging of ~~said~~ the initial regions using ~~said~~ the model parameters up until ~~said~~ the predetermined return is reached ~~to provide said merged segmentation~~.

27. (Currently Amended) Apparatus according to claim 23, wherein ~~said~~ the statistical order is determined using an order of minimum covariance-normalised vector distance between adjacent regions of ~~said~~ the segmentation.

28. (Currently Amended) Apparatus according to claim 23, wherein ~~said~~ the statistical order is determined using a length of a common boundary between adjacent regions.

29. (Currently Amended) Apparatus according to claim 23, wherein ~~said~~ the statistical order is determined by dividing a minimum covariance-normalised vector

distance between adjacent regions of ~~said~~ the segmentation by a length of a common boundary between adjacent regions, and ordering the resulting quotients.

30. (Currently Amended) Apparatus according to claim 29, wherein each ~~said~~ quotient forms a test statistic, a record of which is retained at each merging.

31. (Currently Amended) Apparatus according to claim [[22]] 23, wherein ~~said~~ the plurality of vector components comprise at least two of colour, range and motion.

32. (Currently Amended) Apparatus according to claim [[23]] 31, wherein ~~said~~ the colour vector component comprises at least one colour channel of a colour space in which ~~said~~ the image can be reproduced.

33. (Currently Amended) Apparatus for unsupervised selection of a stopping point for a region-merging segmentation process, said apparatus comprising:

means for analysing a graph of merging cost values to identify departures from substantial monotonicity of ~~said~~ the graph; and

means for selecting ~~said~~ the stopping point to be a merging cost value corresponding to a return to monotonicity of said graph, ~~said~~ the selected stopping point being associated with one of a limited plurality of final ~~said~~ ones of the departures in ~~said~~ the region merging process.

34. (Currently Amended) Apparatus according to claim 33, wherein ~~said~~ the selected stopping point comprises a return from ~~said~~ the final departure.

35. (Currently Amended) Apparatus according to claim 33, wherein ~~said~~ the departures are larger than a predetermined threshold.

36. (Currently Amended) Apparatus according to claim 33, wherein ~~said~~ the merging cost function comprises an ordered series of test statistics, each ~~said~~ test statistic being formed, for each adjacent pair of regions in the segmented image, by dividing a covariance-normalised vector distance between the pair by a length of a common boundary between the pair.

37.-40. (Cancelled)

41. (Currently Amended) A program for making a computer execute a procedure to segment an image formed by a plurality of pixels, each pixel being described by a vector having components each relating to a different measured image characteristic, said program comprising:

code for receiving, for each pixel, a plurality of the vector components and a corresponding error covariance representation of that pixel;

code for, for each pixel, fitting each component and the corresponding covariance representation to a predetermined linear model to obtain a set of model parameters and corresponding confidence representations;

~~A program according to claim 40 wherein said analysing code comprises:~~

code for defining ~~said~~ the pixels to each be initial regions of ~~said~~ the image;

code for merging ~~said~~ the regions in a statistical order using ~~said~~ the sets of model parameters and confidence representations to obtain a null segmentation of ~~said~~ the image;

code for analysing a curve formed using ~~said~~ the model parameters and corresponding confidence representations to determine an optimal halting criterion at which to cease the merging of ~~said~~ the regions; and

code for processing ~~said~~ the merging of ~~said~~ the initial regions to halt when ~~said~~ the optimal merging criterion is reached.

42. (Currently Amended) A program for making a computer execute a procedure for unsupervised selection of a stopping point for a region-merging segmentation process, said program comprising:

code for analysing a graph of merging cost values to identify departures from substantial monotonicity of ~~said~~ the graph; and

code for selecting ~~said~~ the stopping point to be a merging cost value corresponding to a return to monotonicity of ~~said~~ the graph, ~~said~~ the selected stopping point being associated with one of a limited plurality of final ~~said~~ ones of the departures in ~~said~~ the region merging process.

43. (Currently Amended) A program according to claim 42, wherein ~~said~~ the selected stopping point comprises a return from ~~said~~ the final departure.

44. (Currently Amended) A program according to claim 43, wherein ~~said~~ the departures are larger than a predetermined threshold.

45. (Currently Amended) A program according to claim 42, wherein ~~said~~ the merging cost function comprises an ordered series of test statistics, each ~~said~~ test statistic being formed, for each adjacent pair of regions in the segmented image, by dividing a covariance-normalised vector distance between the pair by a length of a common boundary between the pair.